

CLAIMS

What is claimed is:

- 1 1. A method of forming a fluid bearing, comprising:
2 forming a plate having a face surface and a bonding surface opposing the face
3 surface, said plate forming a surface of said fluid bearing;
4 coupling a first side of a body to the bonding surface of the plate;
5 placing the face surface of the plate against a predetermined surface; and
6 generating a pressure difference to conform the face surface to the
7 predetermined surface.
- 1 2. The method of claim 1, wherein during said generating step a pressure at the
2 bonding surface is greater than a pressure at the face surface.
- 1 3. The method of claim 1, wherein the predetermined surface is a guideway and
2 said plate has a pattern formed on said face surface.
- 1 4. A method of forming a fluid bearing as in claim 1 wherein said coupling step
2 uses an adhesive which is flexible before hardening and wherein said generating step
3 is performed during at least a portion of a time that said adhesive hardens such that
4 said face surface replicates a shape of said predetermined surface, and wherein said
5 plate is compliant.

1 5. The method of claim 3, wherein the pattern provides channels for distribution
2 of fluid flow on the face surface.

1 6. The method of claim 4, wherein the plate comprises a material that can be
2 etched and wherein a pattern is formed on said face surface by etching said face
3 surface.

1 7. The method of claim 4, wherein the generating step comprises injecting the
2 adhesive under pressure and creating a vacuum between the face surface and the
3 predetermined surface.

1 8. The method of claim 4, wherein a pattern is formed on said face surface and
2 the pattern includes a plurality of grooves coupled to an orifice.

1 9. The method of claim 4, wherein a pattern is formed on said face surface and
2 the pattern includes a plurality of grooves coupled to an orifice and a fluid flow
3 restrictor on said face surface.

1 10. The method of claim 4, wherein the pattern is formed by eroding said face
2 surface.

1 11. The method of claim 4, wherein said generating step comprises generating a
2 vacuum which is applied through an opening in either the predetermined surface or
3 said plate.

1 12. A fluid bearing produced according to the process of claim 4.

1 13. A fluid bearing comprising:

2 a plate support;

3 a flexible bearing plate having a bonding surface attached to said plate support

4 with an adhesive which is flexible before hardening, and wherein said

5 flexible bearing plate conforms to a predetermined shape.

1 14. The fluid bearing of claim 13, wherein a face surface of said flexible bearing

2 plate has a plurality of grooves for distributing fluid pressure during use of said fluid

3 bearing.

1 15. The fluid bearing of claim 13, wherein said flexible bearing plate is made to

2 conform to said predetermined shape during at least a portion of a time that said

3 adhesive hardens.

1 16. The fluid bearing of claim 15, wherein said flexible bearing plate is made to

2 conform to said predetermined shape by pressing said flexible bearing plate against the

3 predetermined shape.

1 17. The fluid bearing of claim 16, wherein the flexible bearing plate is made to

2 conform by injecting the adhesive under pressure between the plate support and the

3 bonding surface of said flexible bearing plate.

1 18. The fluid bearing of claim 17, wherein the flexible bearing plate is made to
2 conform by applying a vacuum between a face surface which faces said predetermined
3 surface and said predetermined surface.

1 19. A method of forming a vacuum chuck, comprising:
2 bonding a back surface of the chuck plate to a bonding surface of a chuck
3 body;
4 placing a top surface of the chuck plate against a predetermined surface; and
5 generating a pressure difference between the back surface of the chuck plate
6 and the top surface of the chuck plate to conform the top surface to the
7 predetermined surface.

1 20. The method of claim 19, further comprising forming at least one opening on a
2 top surface of said chuck plate, wherein at least one opening on the top surface of the
3 chuck plate is for generating a vacuum and wherein the chuck plate is flexible.

1 21. A method as in claim 20 wherein said vacuum is generated on said top surface
2 during a use of said vacuum chuck.

1 22. A method as in claim 21 wherein said top surface comprises a pattern of
2 grooves on said top surface for distributing said vacuum, said pattern of grooves
3 being coupled to said at least one opening.

1 23. A vacuum chuck produced according to the process of claim 21.

1 24. A method as in claim 22 wherein said pattern of grooves is etched on said top
2 surface.

1 25. A method as in claim 20 wherein said opening comprises a fluid flow
2 restrictor.

1 26. A method as in claim 21 wherein said bonding step comprises applying an
2 adhesive which is flexible before hardening and wherein said generating step
3 comprises generating a vacuum between said predetermined surface and said top
4 surface during at least a portion of a time in which said adhesive hardens.

1 27. A vacuum chuck produced according to the process of claim 26.

1 28. A vacuum chuck comprising:
2 a plate support;
3 a flexible vacuum plate having a top surface for creating a vacuum at said top
4 surface, said flexible vacuum plate having a bonding surface which is
5 attached to said plate support with an adhesive which is flexible before
6 hardening, and wherein the flexible vacuum plate conforms to a
7 predetermined surface.

1 29. A vacuum chuck as in claim 28 wherein said flexible vacuum plate is made to
2 conform to said predetermined surface during at least a portion of a time that said
3 adhesive hardens.

1 30. A vacuum chuck as in claim 29 wherein said vacuum chuck is used to secure a
2 wafer during a wafer processing operation.

1 31. A vacuum chuck as in claim 29 wherein the flexible vacuum plate is made to
2 conform by applying a vacuum between said top surface and said predetermined
3 surface.

1 32. A vacuum chuck as in claim 31 wherein said top surface comprises a plurality
2 of grooves for distributing a vacuum, and wherein said plurality of grooves is formed
3 by etching said top surface.

1 33. A method of forming a guideway, comprising the steps of:
2 providing a face plate having a face surface and a bonding surface opposing
3 the face surface;
4 bonding the bonding surface of the top plate to a body;
5 generating a pressure difference to conform the face surface of the face plate to
6 a predetermined surface.

1 34. The method of claim 33, further including the step of:
2 heating the predetermined surface.

1 35. The method of claim 33, wherein the bonding step uses an adhesive which is
2 flexible before hardening and wherein said pressure difference conforms said face
3 surface during at least a portion of time that said adhesive hardens.

1 36. The method of claim 33, wherein the face plate and the body have a similar
2 coefficient of expansion.

1 37. The method of claim 33, wherein the face plate is plate glass and the body is a
2 fiberglass pulltrusion.

1 38. The method of claim 33, wherein the face plate is a metal tape and the body is
2 a metal extrusion.

1 39. The method of claim 33, wherein the predetermined surface comprises a
2 vacuum generating surface.

1 40. A method of forming a fluid bearing as in claim 7 wherein said generating step
2 further comprises injecting at a predetermined pressure a fluid between the bonding
3 surface and the first side, and wherein said predetermined pressure preloads said fluid
4 bearing.

1 41. A fluid bearing comprising:
2 a bearing plate having a face surface;

3 a surface restrictor on said face surface, said surface restrictor for restricting
4 flow of fluid in said fluid bearing, said surface restrictor comprising a
5 channel formed on said face surface.

1 42. A fluid bearing as in claim 41 wherein said surface restrictor is etched on said
2 face surface.

1 43. A vacuum chuck as in claim 31 wherein said top surface is etched to create a
2 plurality of pins for supporting an object.

1 44. A vacuum chuck as in claim 43 wherein said object is a semiconductor wafer.

1 45. A method of forming a bearing member for a fluid interface comprising:
2 etching a pattern in a bearing plate surface of a bearing plate, said bearing plate
3 surface providing a surface for said fluid interface and said pattern
4 providing for fluid flow in said fluid interface.

1 46. A method as in claim 45 wherein said fluid interface comprises one of a fluid
2 bearing or a vacuum chuck, and wherein said method further comprises bonding said
3 bearing plate to a bearing member.

1 47. A method as in claim 46 wherein said bonding step comprises applying an
2 adhesive which is flexible before hardening between a bonding surface of said bearing

- 3 plate and said bearing member and pressing said bearing plate surface against a
- 4 predetermined surface during at least a portion of a time that said adhesive hardens.

- 1 48. A method as in claim 45 wherein said pattern comprises a fluid flow restrictor
- 2 etched into said bearing plate surface.